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Modeling of Dopant Spectral Emission in Z-Pinch Dynamic Hohlraum Experiments JOSEPH MACFARLANE, I.E. GOLOVKIN, P.R. WOODRUFF, P. WANG, Prism Computational Sciences, G.A. ROCHAU, K. PETERSON, J.E. BAILEY, T.A. MEHLHORN, Sandia National Laboratories — X-ray spectra have been obtained from Si-doped low-density foams in dynamic hohlraum z-pinch experiments at Sandia National Laboratories. The purpose of the dopants is to provide spectroscopy signatures for constraining the time-dependent conditions within the hohlraum. In these experiments, $\sim$ 16 - 18 MA of current is delivered to a load comprised of a tungsten wire array which surrounds a low density cylindrical CH_2 foam. The z-pinch magnetic field accelerates the W plasma radially inward, reaching velocities $\sim$ a few x 10^7 cm/s. As the W plasma strikes the foam, a strong shock propagates through the foam, with temperatures behind the shock reaching $\sim$ a few x 10^2 eV. Time- and space-resolved x-ray spectra from Si K-shell lines are recorded, providing spectra from regions both within the shock and ahead of the shock. To model these spectra, we use the SPECT3D multi-dimensional collisional-radiative spectral analysis code. In this study, we investigate the influence of photopumping of Si transitions in the unshocked foam due to radiation emitted by the shocked foam region. We will present results from recent simulations, and discuss the sensitivity of the spectra to the conditions in the shocked and unshocked foam regions.

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